**UNITED STATES DISTRICT COURT**

**DISTRICT OF ARIZONA**

United States of America,

Plaintiff,

vs.

Anthony Ray Shirley,

Defendant.

CR 13-0622-TUC-RCC (JR)

**REPORT AND RECOMMENDATION**

This matter was referred to Magistrate Judge Rateau for pretrial matters. Pending before the Court is Defendant Anthony Ray Shirley's Motion Under *Daubert* and FRE 403 and FRE 702 to Determine Admissibility of DNA Evidence (Doc. 27). The Government filed a Response (Doc. 39). The defense did not file a Reply. The matter was heard by the Court on June 2, 2014.[1] Defendant was present and represented by counsel. The Government and the Defendant each presented one expert witness. The Government offered four exhibits and the Defense offered 14,

[1] Trial is scheduled for August 19, 2014 and the plea deadline is August 1, 2014. (Doc. 72).

all of which were admitted without objection. Tr. 92.[2] Having considered the matter, the Magistrate Judge recommends that Defendant's motion be denied.

**I. Factual Background**

As alleged by the Government, in the early morning hours of September 16, 2012, Pascua Yaqui police officers responded to a 911 call regarding the sexual abuse of a minor at a residence on the Pasqua Yaqui Indian Reservation. A child at the residence, J.V., 8 years old, informed officers that Defendant made her lick his penis, digitally penetrated her vagina with his finger, and placed his penis against her buttocks.

An investigation into the case revealed that J.V. and her cousin, A.A., 7 years old, were lying on a mattress that was on the living room floor of the residence while a birthday celebration was ongoing in the yard. At some point in the early hours of Sunday morning, Defendant went inside the house, walked into the living room and took each girl, one at a time, into a bedroom of the house wherein he allegedly sexually abused them.

As part of the investigation, the girls were taken for taped forensic interview. J.V. disclosed the above-described abuse. Victim A.A. disclosed that Defendant pulled her pants part way down and touched her buttocks. A sexual assault examination was performed on J.V., which included external vulva swabs to collect

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[2] "Tr." refers to the Transcript of Motion to Determine Admissibility of Evidence, dated June 2, 2014. (Doc. 80). The Court notes that the Defendant's counsel, Jay Marble, is at times incorrectly identified in the transcript as "Mr. Stern." *See* Tr. 97-99.

DNA for comparison purposes. Victim A.A.'s underwear was also collected and submitted for DNA comparison purposes. Buccal swabs were taken from Defendant and submitted for DNA comparison purposes.

**II. DNA Evidence**

DNA is an acronym for deoxyribonucleic acid. Tr. 15. DNA contains a unique "blueprint" to make a human being. *Id*. The blueprint consists of a pattern of DNA on the 23 pairs of chromosomes that all humans have. Ex. 2 (Normal Human Karyotype). Twenty-two of the pairs are called autosomes and are not sex-determinative. *Id*. The mother and father contribute evenly and randomly to the DNA composition of their offspring's autosomes.

The twenty-third pair of chromosomes, the "sex chromosomes," determine a child's sex. Ex. 2. In females the pair consists of two X chromosomes and in males the pair consists of one X and one Y chromosome. *Id*. Because females carry no Y chromosome, the Y chromosome passes from father to son largely unchanged. Thus, a male's Y chromosome contains the same DNA as all members of his paternal lineage. Tr. 21-22.

A very large portion of human DNA is the same. Therefore, in traditional forensic cases, examiners do not look at the areas of DNA that contain the instructions for common traits, such as having two eyes, a nose, and two ears. Rather, examiners look for specific types of DNA at specific locations across the twenty-two pairs of autosomes. *Id*. Analysts can compare a crime scene sample DNA type at a specific location on a chromosome with the DNA type of a suspect at

those same locations on the chromosome. If they match, the DNA in the crime scene sample may have come from the suspect.

By comparing the crime scene and suspect samples at different locations on different chromosomes, analysts can obtain a more accurate match. This is because the autosomes contain a random combination of DNA from the mother and the father. Because the DNA types at different locations are inherited independently of each other, the probability of a match at one location is multiplied by the probability of a match at other locations. This method, known as the "product rule," results in the accuracy of the match increasing exponentially with each location match and enables the analyst to calculate astronomically small probabilities—"in the trillion, quadrillions, quintillions" – that a random person's DNA would match the crime scene sample. Tr. 24-25.

Examination of DNA involves a four step process. The first step is extraction. The step involves adding chemicals to a sample which break open the cells contained in the sample and release the DNA. The second step is "quantitation" and involves determining the quantification of the amount of DNA obtained from the sample. The third step is polymerase chain reaction, or PCR, a process by which the examiner copies the areas of the DNA, called short tandem repeats or STRs, where it is known that people are different. Tr. 16, 43. In step four, the DNA is separated by size in a "genetic analyzer" and, based on their size, used to generate a DNA profile. Tr. 16-17.

In this case, the laboratory applied a variant of the traditional method of forensic DNA analysis, called "YSTR analysis." Tr. 17. In YSTR analysis, the physical process and examination sequence is the same as that of traditional forensic DNA analysis. Tr. 17-18. However, YSTR analysis is used in cases where there is an abundant amount of female DNA and a very small amount of male DNA in mixed samples. Tr. 19. Because females carry no Y chromosome, and because the Y chromosome passes from father to son largely unchanged, YSTR analysis enables examiners to compare DNA found in a crime scene sample with that of a suspect by identifying matching DNA types at specific locations on the Y chromosome. Tr. 21-22. In both processes, the same techniques allow analysts, using kits provided by private companies, to compare DNA types at specific locations on the DNA strands. Tr. 17-18. However, YSTR analysis uses a specific kit, in this case a "YFiler kit," and is limited in that it only examines DNA types on the Y chromosome. Tr. 17-18.

Because YSTR analysis only examines one chromosome, the Y chromosome, it does not allow for the same statistical analysis employed in traditional testing. Tr. 24. If the profile from the sample matches the suspect's Y chromosome profile, the results are less specific and only enable the analyst to conclude that the suspect and his paternal relatives cannot be ruled out as contributors. Tr. 25. With YSTR, in what is called the "counting method," the analyst consults a database of DNA profiles to determine the number of individuals in the database who share the identified Y-chromosome profile. Tr. 25. Based on the number of individuals in the

database that share the profile, an analyst can then calculate what portion of the general population, or in a given subset of the general population, share that profile.

In this case, the YSTR testing was performed by April Stonehouse, who at the time was employed by the Arizona Department of Public Safety. Her report reflects that she examined five groups of items: a cutting of a panty crotch from A.A. (labeled item #8A); two buccal swabs from J.V. (item #14.3); four external vulva swabs from J.V. (item #14.8); one buccal collector from Defendant Anthony Shirley (item #28); and two buccal swabs from A.A. (item #29). Ex. 3 (Scientific Examination Report). Upon examination, Stonehouse obtained a partial male DNA profile from a sperm fraction on the external vulva swabs from J.V. (item #14.8) that matched the male DNA profile from the buccal sample collected from Defendant (item #28) at four (of a possible 17) YSTR loci. *Id.*; Tr. 29. Based on that finding, Defendant and any of his paternally related male relatives could not be excluded as the contributor of the male DNA found on the vulva swabs collected from J.V. *Id.* Using Applied Biosystems Yfiler haplotype database, Stonehouse determined that the DNA profile was not expected to occur more frequently than one in every: 63 Caucasian males; 142 African-American males; 53 Hispanic males; and 35 Native American males. *Id.*, Tr. 26. Stonehouse also obtained a partial male DNA profile from A.A.'s panty crotch cutting. *Id.* That profile did not match that of Defendant. *Id.*

## III. Discussion

The Government seeks to offer Ms. Stonehouse's analysis and conclusions at trial. The Defendant contends Stonehouse's testimony should be excluded as unreliable due to the very low level of male DNA detected on the vulva swabs taken from J.V. and because the Defendant's DNA matched only 4 of 17 loci on the DNA that was found. Defendant also questions the validity and reliability of Stonehouse's conclusion that the DNA profile found on the vulva swabs would occur in 1 out of 35 Native American Males. Defendant contends that the number is more prejudicial than probative and that it might also be inaccurate when applied to specific Native American tribes.

### A. Motion to Exclude Under Rule 702

Federal Rule of Evidence 702 permits testimony by experts qualified by "knowledge, skill, expertise, training, or education" to testify "in the form of an opinion or otherwise" based on "scientific, technical, or other specialized knowledge" if that knowledge will "assist the trier of fact to understand the evidence or to determine a fact in issue." Fed. R. Evid. 702. The rule also requires that the expert's testimony be "based upon sufficient facts or data" and "the product of reliable principles and methods" which the expert has reliably applied to the facts of the case. *Id.* The gatekeeping function requires the judge to assess whether "the reasoning or methodology underlying the testimony is scientifically valid," and "whether that reasoning or methodology properly can be applied to the facts in issue." *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 592–93 (1993).

In *Daubert*, the Supreme Court ruled that Fed. R. Evid. 702 imposes upon a trial judge a special obligation to act as a gatekeeper regarding scientific testimony. 509 U.S. at 592-93, 597. The purpose of this function is to ensure that the expert's proffered testimony is both reliable and relevant. *See United States v. Freeman*, 498 F.3d 893, 901 (9th Cir. 2007). "Relevancy simply requires that '[t]he evidence . . . logically advance a material aspect of the party's case.'" *Estate of Barbarin v. AstenJohnson, Inc.*, 740 F.3d 457, 463 (9th Cir. 2014) (quoting *Cooper v. Brown*, 510 F.3d 870, 942 (9th Cir. 2007). In examining reliability, the district court must determine whether the proposed expert testimony has "a reliable basis in the knowledge and experience of the relevant discipline." *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 149 (1999). "The focus, of course, must be solely on principles and methodology, not on the conclusions they generate." *Daubert*, 509 U.S. at 595; *see also Primiano v. Cook*, 598 F.3d 558, 564 (9th Cir. 2010).

"[*Daubert*] suggested a flexible, factor-based approach to analyzing the reliability of expert testimony." *United States v. Prime*, 431 F.3d 1147, 1151-52 (9th Cir. 2005) (citing *Daubert*, 509 U.S. at 593–95). The non-exclusive factors include: (1) whether a method can be or has been tested; (2) the known or potential rate of error; (3) whether the methods have been subjected to peer review; (3) whether there are standards controlling the technique's operation; and (4) the general acceptance of the method within the relevant community. *Id*. at 1152 (citing *Daubert*, 509 U.S. at 593–94).

**1. Expert Qualification**

The Defendant does not question the Government's expert's qualifications to provide expert testimony, nor could he. Ms. Stonehouse graduated with honors from the University of Arizona with two Bachelors of Science degrees, one in Biochemistry and the other in Molecular and Cellular Biology, and also has minor degrees in mathematics, physics and chemistry. Tr. 10-11. She is a member of the American Academy of Forensic Science and the Southwestern Association of Forensic Scientists. Tr. 11. She has completed serology and DNA training at the Arizona Department of Public Safety's Central Regional Crime Laboratory and presently works for the Mesa Police Department, Forensic Services Division. Her primary duties in her present position include serology examinations, DNA analysis, and preparing reports with statistical evaluations of the results. Tr. 10. She was previously employed for 12 years by the Arizona Department of Public Safety, Southern Regional Crime Lab, in Tucson, where she was a supervisor and DNA analyst. Tr. 10. She has testified about serology and DNA analysis in both the state and federal courts. Tr. 11.

The Court finds that Ms. Stonehouse's education, training, specialized knowledge and experience as a forensic examiner and DNA analyst qualify her to provide expert testimony on DNA examination and population statistics.

**2. YSTR Database**

The Defendant questions the validity and reliability of Ms. Stonehouse's conclusion that the DNA profile found on the vulva swabs would occur in 1 out of 35 Native American Males. Specifically, Defendant contends:

> It is unclear from the analyst's report if the statistic of 1 in 35 Native Americans includes only Southwestern Native Americans or all Native Americans in general. If the latter is true, that statistic would be extremely misleading. A "Native American" statistical population that includes very diverse Native Americans from all over the United States such as Iroquois, Seminole, Penobscot, Blackfeet, Cheyenne, Lakota, Chippewa Cree, Crow, Navajo, and Apache would be a misleading statistic. In smaller, more isolated Native American communities, the statistical probability that tribal members have more genetic similarities would be much higher. This would cast serious doubt on the statistic of 1 in 35. The number, if compared to only Native Americans in small, regional communities, would be much more common—maybe as common as 1 in 10.

*Defendant's Motion*, p. 6.

While at first blush this argument has some appeal, the expert testimony elicited at the *Daubert* hearing did not bear it out. On cross-examination by the Defendant's counsel, Ms. Stonehouse disagreed with the notion that the genetic profile found on the vulva swabs would be more common if only the male members of Defendant's tribe were considered rather than the Native American population in general. As she testified, Native American populations have a large degree of common ancestry. Tr. 70. By way of example, she explained:

> these statistics, if you noticed from the statistics that I discussed earlier, one in 35 is actually the lowest [ratio], and that is the frequency or estimate of the frequency in the Native American populations. In a [C]aucasian population, it would be one in 1,373. And those numbers

> are reflective of the fact that there is more common ancestry in the Native American populations than in the [C]aucasian, for example.

Tr. 71. In response to Ms. Stonehouse's testimony, the Defendant offered the testimony of his own DNA expert, Blaine Kern. Tr. 72. However, Defendant's counsel elicited no testimony from Mr. Kern contradicting Ms. Stonehouse's explanation of the statistical conclusions she reached. As such, this argument provides no basis for exclusion under Rule 702 and *Daubert*.

**3. Methodology**

The Defendant also argues that the results should be excluded as unreliable due to the very low level of male DNA detected on the vulva swabs taken from J.V. and because the Defendant's DNA matched only 4 of 17 loci on the DNA that was found.

Ms. Stonehouse testified that the amount of DNA found on the swabs was so small that it was reported as "undetected." Tr. 60. The Defendant's counsel seized on this finding and attempted to equate it to a finding of "none" or "zero" DNA. *Id*. However, Ms. Stonehouse explained that "undetected" did not equate to "none detected," but was a reflection of the limitations of the instrumentation used in the laboratory. Tr. 60-61. Ms. Stonehouse further explained that after the DNA was chemically amplified, male DNA was detected. Tr. 66-67. From that sample, Ms. Stonehouse, following the guidelines of the DPS laboratory, was able to determine to a reasonable degree of certainty that the Defendant's Y chromosome profile matched the Y chromosome profile found on the swabs at four loci. Tr. 28. Additionally, the

testing produced data at other loci that, while not above the laboratory standards to be used for statistical purposes, was consistent with the Defendant's profile. Tr. 28-29.

At the *Daubert* hearing, Mr. Kern, the Defendant's expert, opined that the amount of DNA found on the swabs was too small to properly used for comparison and that Ms. Stonehouse's methods were "a misuse of the system, and [went] well beyond the—the parameters that are set forth by the manufacturer of the kit." Tr. 75. His concerns were centered around the possibility that contamination could have occurred and resulted in an unreliable result based on such a small sample of DNA. As he stated, "I'm not saying that there's not DNA in that sample. Obviously, there's DNA in that sample because there's results. The question is: Where did that DNA come from?" Tr. 76-78.

Viewing this evidence in totality, the Court finds that the Defendant's expert's opinions do not undermine the science or methodology employed by the Government's expert, and thus go to the weight rather than the admissibility of the evidence. The experts' testimony establishes that there are differing views as to the minimum amount of DNA required to be present to be properly amplified for testing. That issue, along with potential contamination and other events that might impact DNA testing, should be the subject of cross-examination. *See Ruiz–Troche v. Pepsi Cola of Puerto Rico Bottling Co.*, 161 F.3d 77, 85 (1st Cir. 1998) ("*Daubert* does not require that a party who proffers expert testimony carry the burden of proving to the judge that the expert's assessment of the situation is correct. As long as an expert's scientific testimony rests upon good grounds, based on what is known, it should be

tested by the adversary process—competing expert testimony and active cross-examination—rather than excluded from jurors' scrutiny for fear that they will not grasp its complexities or satisfactorily weigh its inadequacies." (citation and quotation signals omitted)); *see also Primiano v. Cook*, 598 F.3d 558, 564 (9th Cir. 2010) ("Shaky but admissible evidence is to be attacked by cross examination, contrary evidence, and attention to the burden of proof, not exclusion."). Accordingly, the court finds that the DNA techniques employed by the Government pass *Daubert* scrutiny.

**B. Rule 403**

The Defendant argues that the evidence is inadmissible pursuant to Rule 403, which provides that "[t]he court may exclude relevant evidence if its probative value is substantially outweighed by a danger of one or more of the following: unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence." "Rule 403 and *Daubert* address different aspects of evidence and therefore act independently." *United States v. Ramirez-Robles*, 386 F.3d 1234, 1246 (9th Cir. 2004). Even if found reliable under *Daubert*, scientific evidence may be "excluded by Rule 403 if its probative value is outweighed by its prejudicial impact." *Id.*

Here, the Defendant argues that Rule 403 precludes the DNA evidence because the source of the DNA cannot be sufficiently established and "[p]roviding the jury with DNA evidence that is not a complete match and only rules out a small

portion of the specific community does not clarify anything." *Defendant's Motion*, pp. 6-7.

The Ninth Circuit has recognized the concerns the Defendant raises and warned that district courts must guard against two general tendencies: "(1) that the jury will accept the DNA evidence as a statement of source probability (*i.e.*, the likelihood that the defendant is the source of the evidentiary sample); and (2) that once the jury settles on a source probability, even if correctly, it will equate source with guilt, ignoring the possibility of non-criminal reasons for the evidentiary link between the defendant and the victim." *United States v. Chischilly*, 30 F.3d 1144, 1156 (9th Cir. 1994), *overruled on other grounds by United States v. Preston*¸751 F.3d 1008 (9th Cir. 2014). Rule 403 therefore "requires judicial vigilance against the risk that such evidence will inordinately distract the jury from or skew its perception of other, potentially exculpatory evidence lacking not so much probative force as scientific gloss." *Id.* However, the Ninth Circuit has explained that "statistical evidence derived from sample processing and match analysis, properly documented and performed in compliance with established, peer-reviewed laboratory protocols, is certainly probative . . . ," and "[w]here the district court provides careful oversight, the potential prejudice of the DNA evidence can be reduced to the point where this probative value outweighs it." *Id.* at 1158. With this caveat being noted, the Court finds that the proposed evidence is not precluded under Rule 403.

**III. Recommendation for Disposition by the District Judge**

Based on the foregoing and pursuant to 28 U.S.C. § 636(b) and Local Rule Civil 72.1, Rules of Practice of the United States District Court, District of Arizona, the Magistrate Judge recommends that the District Court, after an independent review of the record, DENY Defendant Anthony Ray Shirley's Motion Under *Daubert* and FRE 403 and FRE 702 to Determine Admissibility of DNA Evidence (Doc. 27).

This Report and Recommendation is not an order that is immediately appealable to the Ninth Circuit Court of Appeals. Any notice of appeal pursuant to Rule 4(a)(1), Federal Rules of Appellate Procedure, should not be filed until entry of the District Court's judgment in the case.

Pursuant to 28 U.S.C. §636(b)(1)(B), the parties have fourteen (14) days from the date of this Report and Recommendation to file written objections to these findings and recommendations with the District Court. Any Objections and Responses to objections filed should be filed as CR 13-0622-TUC-RCC. No Replies shall be filed unless leave is granted from the District Court.

Dated this 9th day of July, 2014.

Jacqueline M. Rateau
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United States Magistrate Judge